

What Is Claimed Is:

1. A recording medium for storing a program executable by an information apparatus for implementing a parallel matrix processing method in matrix processing carried out by a shared-memory scalar parallel-processing computer having a plurality of processor modules, said method comprising:

dividing a matrix into small matrix blocks;
10 storing diagonal blocks and small matrix sub-blocks of said small matrix blocks other than said diagonal blocks in local memories of said processor modules;

15 redundantly processing said diagonal blocks in said processor modules by driving said processing modules to process their own small matrix blocks in parallel; and

20 updating said matrix with results of processing of said small matrix blocks obtained at said processing step.

2. A recording medium according to Claim 1 wherein said matrix processing is LU factorization applied to said matrix.

3. A recording medium according to Claim 2, said method further comprising:

extracting candidates for pivots from data of said small matrix blocks processed by said processor modules; and

determining a final one of said pivots with a maximum data value among said candidates in a memory area common to said processor modules, and

wherein said LU factorization is carried out by using said determined pivot.

4. A recording medium according to Claim 2 wherein said LU factorization of said entire matrix is completed by execution of the method comprising:

15 sequentially updating portions of said matrix starting with one on the outer side of said matrix in accordance with a recursive algorithm; and

eventually applying said LU factorization by using one processor module to a portion that 20 remains to be updated inside said matrix.

5. A recording medium according to Claim 1 wherein said matrix processing is Cholesky factorization or a modified version of said Cholesky factorization applied to said matrix.

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6. A recording medium according to Claim 5
wherein said Cholesky factorization or said
modified version of said Cholesky factorization is
5 carried out to complete said LU factorization of
said entire matrix by execution of the method
comprising:

10 sequentially updating portions of said matrix
starting with one on the outer side of said matrix
in accordance with a recursive algorithm; and

eventually applying said LU factorization by
using one processor module to a portion that
remains to be updated inside said matrix.

15 7. A recording medium according to Claim 5
wherein, at said updating step,

20 a triangular matrix portion of each of said
small matrix block to be updated is divided into $2 \times$
N fine blocks wherein the symbol N denotes the
number of processor modules; and

said fine blocks are assembled to form N pairs
each stored in a local memory area of one of said
processor modules to be processed by said processor
module.

8. A parallel matrix processing method applied to matrix processing carried out by a shared-memory scalar parallel-processing computer having a plurality of processor modules, said parallel matrix processing method comprising:

dividing a matrix into small matrix blocks;
storing diagonal blocks and small matrix sub-blocks of said small matrix blocks other than said diagonal blocks in local memories of said processor modules;

redundantly processing said diagonal blocks in said processor modules by driving said processing modules to process their own small matrix blocks in parallel; and

15 updating said matrix with results of
processing of said small matrix blocks obtained at
said processing step.

9. A shared-memory scalar parallel-processing computer having a plurality of processor modules, said shared-memory scalar parallel-processing computer comprising:

a blocking unit dividing a matrix into small matrix blocks;

25 a storage unit storing diagonal blocks and

small matrix sub-blocks of said small matrix blocks other than said diagonal blocks in local memories of said processor modules;

5 a processing unit redundantly processing said diagonal blocks in said processor modules by driving said processing modules to process their own small matrix blocks in parallel; and

10 an updating unit updating said matrix with results of processing of said small matrix blocks produced by said processing means.

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